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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Satoshi Seo et al.
Serial No. : 10/072,507
Filed : February 5, 2002
Title : LIGHT EMITTING DEVICE

Art Unit : 2822
Examiner : Keisha Rose
Confirmation No.: 7036

MAIL STOP AF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY TO ACTION OF NOVEMBER 3, 2004

Applicant requests allowance of the claims in view of the following remarks.

Claims 1-43 are pending in this application, with 1-4, 14, 18, 22, 26 and 35 being independent. Claims 14-25 have been withdrawn from consideration.

Claims 1-8 and 11-13 have been rejected as being anticipated by Shi, U.S. Patent No. 5,817,431.

With respect to claim 1 and its dependent claims, applicant requests reconsideration and withdrawal of the rejection because Shi does not describe or suggest a first concentration change region in which the proportion of the electron transporting material increases gradually until a ratio between the hole transporting material and the electron transporting material becomes $x : y$ (where x and y are positive constants); a mixture region containing the hole transporting material and the electron transporting material at the ratio of $x : y$; and a second concentration change region in which the proportion of the electron transporting material gradually increases further from the $x : y$ ratio, as recited in claim 1.

As noted by the Examiner, Shi includes a hole transporting layer 18, an emitter layer 20 that the rejection equates with the recited mixture region, and an electron transporting layer 22. However, Shi nowhere describes or suggests locating a first concentration change region between the hole transporting layer 18 and the emitter 20 or a second concentration change region between the emitter 20 and the electron transporting layer 22.

With respect to this failure by Shi, the rejection appears to assert that (1) the recitation of the properties of the concentration change regions is merely recitation of "an optimum value" that is not entitled to patentable weight and (2) the recitation of "gradually increasing" is a

process limitation that is not related to patentability. Applicant disagrees with both of these assertions.

First, the recitations of having the ratio gradually increase to $x : y$ in the first concentration change region, having the ratio be at $x : y$ in the mixture region, and having the ratio increase from $x : y$ in the second concentration change region are in no way recitations of an optimal value. Indeed, no particular value, whether optimal or otherwise, is assigned to x or y . In addition, in this arrangement, as noted in the application at, for example, page 11, line 24 to page 12, line 4, the concentration change regions have the significant result of causing the carrier input to the organic compound film to be transported smoothly to the mixture region without being obstructed by a large energy barrier. Thus, the recitation of changing ratios in claim 1 is more than a mere recitation of optimal values and, accordingly, is entitled to patentable weight such that this recitation is sufficient to distinguish Shi, which does not describe or suggest such changing ratios.

Second, the recitation of "gradually increasing" is not a process limitation. Rather, it is a limitation on the properties of the concentration change regions of the device recited in claim 1. For example, if a device according to claim 1 were analyzed, the first concentration change region would include a proportion of the electron transporting material that increases gradually until a ratio between the hole transporting material and the electron transporting material becomes $x : y$. Thus, since the "gradually increasing" nature of the concentration change regions are structural limitations on the device, and are not directed to the process used to make the device, they are entitled to patentable weight and are sufficient to distinguish Shi, which does describe or suggest concentration change regions having such gradually increasing ratios.

For at least these reason, the rejection of claim 1 and its dependent claims should be withdrawn.

Independent claims 2-4 also recite concentration change regions such as are recited in claim 1. Accordingly, applicant requests reconsideration and withdrawal of the rejection of claims 2-4 and their dependent claims for the reasons discussed above with respect to claim 1.

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Claims 9 and 10, which depend from claims 1-4, have been rejected as being obvious over Shi. Applicant requests reconsideration and withdrawal of this rejection for the reasons discussed above with respect to the independent claims.

Claims 26-43 have been rejected as being unpatentable over Shi in view of Shibamoto, U.S. Patent No. 6,346,973. Independent claims 26 and 35 also recite concentration change regions such as are recited in claim 1. Accordingly, applicant requests reconsideration and withdrawal of the rejection of claims 26-43 for the reasons discussed above with respect to claim 1 and because Shibamoto does not remedy the failure of Shi to describe or suggest the concentration change regions.

Applicant submits that all claims are in condition for allowance.

No fees are believed due. Please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

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